

From the Author,

[Reprinted from St. Bartholomew's Hospital Reports, Vol. XXV.]

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## INSOMNIA : ITS CAUSES AND TREATMENT.<sup>1</sup>

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Normal sleep we may fairly regard as the outcome of two conditions—rest of the brain-cells, and anæmia of the brain. The first of these depends evidently and greatly on the absence of any external stimulus, as in the case of the lad (mentioned by Professor M. Foster) who could be put to sleep at will by closing his solitary eye and stopping his one ear. Perhaps, too, this quiet may be partly toxic; the products of nerve-work may prove inhibitory to nerve-energy, as the lack of intra-molecular oxygen or the bye-products of contraction are to a muscle. And from exhaustion of the brain-cells may naturally come spasm of the cerebral arterioles, producing the second condition, *i.e.*, of cerebral anæmia.

Granting that this state—whether primary or secondary is of no moment here—obtains in sleep, the ingenious experiment of Chapin,<sup>2</sup> quoted by Dr. Long Fox, becomes intelligible and confirmatory. He administered nitrite of amyl with the greatest care to a number of sleepers, with the effect of waking them most successfully—presumably by dilating the smaller cerebral arteries, and so flooding the brain with blood.

In considering the causes of insomnia, we may consequently and conveniently divide them into corresponding classes:—

- (a.) Where the cerebral cells are in an excited state; and
- (b.) Where the blood-supply to the brain does not permit of sleep.

Under the first heading, then, will come cases of damage to the brain from cerebral hæmorrhage, thrombosis, and embolism. Here, whether owing to the shock to the brain generally, or to the irritation around the lesion, it is not uncommon to get

<sup>1</sup> A paper read before the Lincoln Medical Society, October 30, 1889.

<sup>2</sup> The Influence of the Sympathetic in Disease, by E. Long Fox, M.D., p. 217.

sleep broken by restlessness, excitement, or active delirium. For instance, in a man who had right hemiplegia with temporary motor aphasia—due probably to arterial thrombosis—this was very marked. And in a woman, also hemiplegic on her right side, and permanently aphasic, this condition of sleeplessness and “wandering” continued off and on for some months. One of these cases may have been syphilitic, and syphilis is known to produce delirium. Whether it does so apart from the softening of the brain which follows thrombosis, or from the damage wrought by gummatous tumours, I cannot say.

In tumours of the brain sleeplessness caused by delirium is far from rare. In a case of cerebellar tumour, for example, the boy would continually turn over in bed, and wake up with a sharp scream. In a case of cerebral abscess restlessness and wandering were noticeable. In meningitis this state of delirious wakefulness is constantly seen, but the pain in the head is partly responsible for keeping the child awake, even when there seems to be no delirium.

Of the insomnia of acute mania, with or without delirium, I have no clinical experience.

Closely allied to these cerebral diseases—sometimes so like them that diagnosis is well nigh impossible for a day or two—is the insomnia and delirium of pyrexia. Besides the effect of the specific poison of scarlatina, typhoid, and the other acute fevers, there is a general irritant to the brain in the presence of over-hot blood, which produces delirium. Now this delirium and accompanying insomnia may occur whenever the temperature is a degree or two ( $100^{\circ}$  and upwards) above the normal, and the younger the child or the more exhausted the patient, the more enduring will be the delirium. In the sharp febrile attacks of acute pneumonia, to which children are very liable, the occurrence of delirium is almost a certainty, and, in the interest of the patient's strength, requires careful treatment. Sleeplessness in phthisis, not dependent on coughing or on the profuse sweating, is common enough: probably the fever is the cause thereof.

Again, overwork and worry—when the mind, like a caged animal, is perpetually going over certain events or lines of thought—these are very familiar causes of insomnia. Partly, no doubt, they depend on too great a blood-supply being kept up, but surely the mere cerebral activity demands that full blood-supply. Nothing makes a patient “break down” more readily than continued anxiety and sleeplessness. Even in the time of Aretæus this was recognised. “Insomnolency,” he remarks, “induces dyspepsia, atrophy, and wearies out the body; the spirits flag, and the understanding is unsettled; and for these

reasons such patients readily pass into mania and melancholy.”<sup>1</sup> And perhaps here a more modern quotation may be allowed from Dr. Hood (who was once of the Bethlehem Hospital), given in Hilton’s classic work on Rest and Pain. He says, “I am frequently applied to for the admission of lunatics into this hospital whose insanity is caused by over-mental work, anxiety, or exertion, and for whose cases nothing is required to restore the mental equilibrium but rest.”

Passing now to the action of drugs in causing insomnia, first and foremost comes alcohol. Anstie tells us,<sup>2</sup> and I have frequently ascertained the same fact from patients, that in confirmed toppers, a considerable time before any symptoms of delirium tremens appear, a motor restlessness, turning from side to side, has robbed them of their rest. This loss of control over the muscles does not manifest itself so much while the patient is awake, but it is probable that it runs on almost imperceptibly into the tremors of the later stages of alcoholism. Sleep generally has failed a man entirely for some few days before the onset of delirium tremens, and this alcoholic insomnia, and the hard task of feeding the patient, are the worst and most difficult symptoms to tackle in this dangerous complaint. Herein, truly, of all diseases, do we echo the maxim of Hippocrates, “that when sleep puts an end to delirium, it is a good symptom.”<sup>3</sup> Sleep that can put an end to the feverish and useless workings of mind and body, the exertions to escape from fancied terrors—sleep indeed then is “the welcome, the thrice-prayed for, the most fair.”

With regard to opium, morphine, and cannabis indica as hypnotics, no very uncommon, and quite a sufficiently disagreeable, experience is to find one’s patients only excited the more, instead of being soothed by these drugs. All of them have an exciting stage, and in some individuals they never seem to get beyond this.

Another drug—of little use now medicinally—which acts in widely varying ways on different people, is tobacco. To some, I know it is a decided ‘cerebral stimulant, like snuff-taking or the process mentioned by Dean Swift:—

“You beat your pate and fancy wit will come ;  
Knock as you will, there’s nobody at home.”

To others it is a narcotic from the first. Under the second heading its action on the heart will be noticed.

One of the chief objections I have found to the treatment of

<sup>1</sup> Aretæus : Sydenham Society’s translation, p. 466.

<sup>2</sup> Reynolds : System of Medicine, vol. ii. p. 71.

<sup>3</sup> Hippocrates : Sydenham Society’s translation, vol. ii. p. 705.

heart-disease with dropsy by caffeine is the sleeplessness it produces, an effect perhaps partly due to the irregularity in the heart's action which large doses of it cause.

The second class of causes may now be considered—those due directly to the condition of the cerebral circulation.

Nothing is more common in bad cases of heart-disease, particularly, I think, in mitral regurgitation, in disease following chronic bronchitis, and in aortic valvular disease, with attacks like angina pectoris, than to get insomnia. This depends to a certain extent on the position of orthopnoea such patients must assume—necessary but extremely uncomfortable; but it is due far more, I believe, to the varying action of the heart on the blood-supply to the brain.

In functional heart-troubles, too, such as the attacks of palpitation to which anæmic and chlorotic patients are so liable, this irregular action of the heart accounts chiefly for the insomnia whereof they so generally complain.

This, again, is the explanation of the sleeplessness produced by tea. The essential alkaloid of tea, like that of coffee, no doubt in large doses causes irregularity in the heart-beats, but the tannin present, especially in tea that has stood some time, seems to act as a direct poison to the stomach, interfering with digestion, and so embarrassing the action of the heart. This I have found (particularly in elderly people) perhaps the commonest cause of dyspepsia that exists; and this is obviated in some degree by the habit of taking milk in tea, so precipitating a tannate of casein in an insoluble form; and still more so by the use of cream. Also one characteristic of the insomnia due to tea is this: you may get to sleep all right at once, but in an hour or two you wake up with palpitation of the heart, and a feeling of certainty that for some hours sleep will be impossible; and so it is.

Dyspepsia and flatulence from the presence of partially digested food in the stomach produce sleeplessness in the same kind of way: so, too, does tobacco.

As a part of the great nervous excitement which attends the "change of life" in women, insomnia is frequent, and is a very troublesome symptom. The chain of events is much the same as has been mentioned before, hysterical flatulency giving rise to palpitation, and the irregular action of the heart reacting in its turn on the brain, thus preventing sleep.

How singularly modern this sounds: "Sleep after a meal during the day does not agree with all, because the time spent in sleep is not sufficient for the complete digestion of the food."<sup>1</sup>

<sup>1</sup> Paulus Ægineta: Sydenham Society, vol. i. p. 180.

Paulus Ægineta's reason does not appeal quite to us, for we believe that sleep stops digestion to some extent—not entirely—for the stomach will be quite empty in the morning after a heavy supper; it is probable that the muscular movements thereof do not continue during sleep.

Another class of patients may be mentioned next—those whose arterial tension is high or low. Dr. Broadbent has dealt with these cases very graphically in his Croonian Lectures in 1887.<sup>1</sup> In the first set, with high arterial tension (such as is common in chronic interstitial nephritis), the blood-pressure in the brain will be high also, as the arterioles are unable to resist the pressure, and so sleep is prevented. Again, in many elderly persons the cerebral (as well as other) arteries are becoming rigid; at night, when they should contract and lessen the blood-supply, they do not, and thus keep the person awake.

In a second class of cases the explanation of insomnia is still more interesting. Their pulses show low tension, the heart acting feebly, and these are the class of persons who find themselves so sleepy after meals, and while they are sitting more or less upright. For the food in the stomach requires a free supply of blood to the stomach, and the cerebral vessels are poorly supplied. But when, however, these people lie down, fondly hoping to sleep, the weak walls of their cerebral arteries yield to the blood-pressure, now aided by the action of gravity, and their brains get too free a supply of blood to allow of sleep. In all these instances, insomnia pure and simple, or at most allied with delirium, has been considered; when the element of pain comes in, the sleeplessness so produced is foreign to my subject.

And now for a few brief remarks on treatment. Taking the simplest remedies first, a warm foot-bath just before getting into bed, with or without a dash of mustard, is one of the best hypnotics in existence. It draws a large amount of blood to the extremities and skin, and is useful in the most ordinary cases of sleeplessness, no less than in those later stages of Bright's disease with high arterial tension, hypertrophied heart, and a tendency to cerebral hæmorrhage. Better still, from the reaction which follows, is a cold foot-bath; but this is not for people of feeble circulation. The same remarks will apply to a general warm bath.

Next on the list of remedies comes one which can easily be combined with the preceding, a warm drink—a nightcap, so to speak—the last thing at night. Among the more dangerous remedies to recommend, though it acts capitally, is a glass of spirits and water, hot and sweetened. Beer again, light and

<sup>1</sup> British Medical Journal, 1887, vol. ii. p. 763.

well hopped, answers well—the hops perhaps acting as a soporific.

For patients for whom alcohol should not be prescribed, a cup of warm gruel, or better still, of that admirable preparation Benger's food, is quite as effectual. The superior advantage of the latter consists in this, that it can be partially or wholly digested before taking it, so that it does not lie heavy on the stomach, as milk and arrowroot, &c., are apt to do at night.

For the over-worked and worried, change of scene and employment is the best physic; cares of all kinds should be driven away as much as possible. A month or two abroad or on a sea-voyage, with *no* letters or telegrams, will do them more good than all the sedatives and hypnotics in the pharmacopœia; and some bromide of potassium as well is of considerable service in these cases.

Drugs for the relief of insomnia mean rather a large order, but those alone will be mentioned here whose use has been tried on the writer or his patients.

The simplest here again is glycerine. For those troubled nightly with flatulence and consequent palpitation, especially for that form of insomnia described as due to tea, nothing gives such instantaneous and sure relief as a teaspoonful or two of glycerine. Probably, besides relieving the flatulence, it decreases the blood-pressure in the cerebral arteries by drawing more blood to the stomach and intestines.

For the patients with high-tension pulse and sleeplessness, Dr. Broadbent recommends a dose of mercurial pill or black draught. I think, too, this condition of insomnia can be warded off by continued treatment by small doses of nitro-glycerine.

For those with low-tension pulse, tonics, strychnia, iron, or digitalis (or even caffeine), are the drugs indicated.

Opium I have generally given in the form of 15 or 20 minims of the tincture, but I much prefer the hypodermic injection of morphine. Especially in heart-disease are its good effects manifest, and where there is headache in cerebral tumours and meningitis, it deadens the pain and stops the vomiting somewhat. But both opium and morphia are mostly used as anodynes, and the dangers attending their use *by patients* are only too common and obvious.

From *cannabis indica*, in doses of two-grain pills of the extract, I have seen satisfactory results; frequently I have taken it myself at varying times of day and night, but it has had no results of any kind.

In hysterical insomnia, bromide of potassium with some sumbul has seemed of service, though it has often been disap-

pointing from its "masterly inactivity" in delirium tremens. In treating this latter disease, it is often combined with chloral hydrate which is dangerous from the frequent weakness of such patients' hearts.

In Bright's disease with high-tension pulse, chloral has been of great use, and I fancy in cases of cerebral hæmorrhage (of small extent) calming the patient; and as it contracts the cerebral vessels, perhaps lessening the risk of further bleeding.

Sulphonal in doses of five-grain tabloids has given me natural refreshing sleep with no ill effects; its comparative tastelessness makes it a valuable hypnotic.

But paraldehyde is the drug most lately used, and most in favour with the writer. Its action on the brain is the same as that of chloral, and it strengthens the heart's action, slows the pulse, and is, besides, a powerful diuretic. In phthisis and other diseases where the stomach is irritable, it has not seemed to be at all well borne; but in delirium tremens, cerebral affections, pneumonia, bronchitis, and several others, it has acted splendidly. I have generally given it in 30-minim doses, with peppermint-water and syrup. Within reasonable limits its use is safe, and its action is very sure. The disadvantage of it lies in its disagreeable taste, which hangs about in the mouth for some hours after. To avoid this, Messrs. Green & Co. have made me some 30-minim gelatine capsules, so that the drug should be swallowed without being tasted. These are too big, I fear, for most patients, but two capsules of 15 minims each would answer well, and be, I feel sure, the best way of exhibiting paraldehyde.

